

United States Patent [19]

Reynolds et al.

[11] Patent Number: 4,474,446

[45] Date of Patent: Oct. 2, 1984

[54] FOCAL SENSOR HAVING OPTICAL LOW PASS FILTER

[75] Inventors: George O. Reynolds, Waban; Burton R. Clay, Wayland, both of Mass.

[73] Assignee: Honeywell Inc., Minneapolis, Minn.

[21] Appl. No.: 393,565

[22] Filed: Jun. 30, 1982

[51] Int. Cl.³ G03B 7/08; G01J 1/42; G02B 5/18; G02B 5/20

[52] U.S. Cl. 354/402; 354/479; 250/204; 250/237 G; 350/311; 350/162.24

[58] Field of Search 354/25 R, 25 A, 25 N, 354/25 P, 31 F, 59, 402-409, 479, 482; 250/201, 204, 237 R, 237 G; 350/311, 314, 162.11, 162.15, 162.16, 162.24

[56] References Cited

U.S. PATENT DOCUMENTS

3,402,001	9/1968	Fleisher	350/162.24 X
3,631,360	12/1971	Lehovec	350/162.16 X
3,904,869	9/1975	Stauffer	354/25 X
4,048,492	9/1977	Hartmann	250/237 G
4,132,888	1/1979	Kondo	354/25 X

4,247,763 1/1981 Stauffer 350/314 X

FOREIGN PATENT DOCUMENTS

2082335 3/1982 United Kingdom 250/201

OTHER PUBLICATIONS

"Electronic Focus for Cameras", Stauffer et al., Scientific Honeyweller, vol. 3, No. 1, Mar. 1982, pp. 1-13.

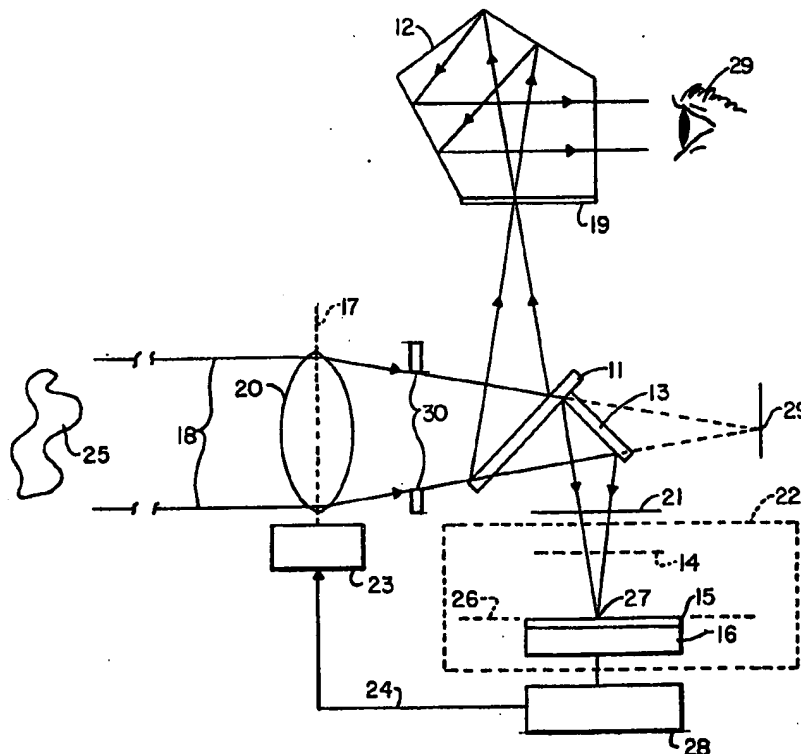
Primary Examiner—William B. Perkey

Attorney, Agent, or Firm—John S. Solakian; Laurence J. Marhoefer

[57] ABSTRACT

A system having a scaled anti-aliasing random phase filter for use in optical imaging systems having a sampled focal plane or an automatic focussing device. The filter is scaled so that it may be placed near the focal plane or automatic focus sensing device, yet produce the effect of an anti-aliasing filter at the exit pupil of the optical system. In one example, the filter includes a scaled hologram of a Sayanagi filter located at the exit pupil. In a second example, the filter includes a scaled double chirped diffraction grating.

20 Claims, 5 Drawing Figures



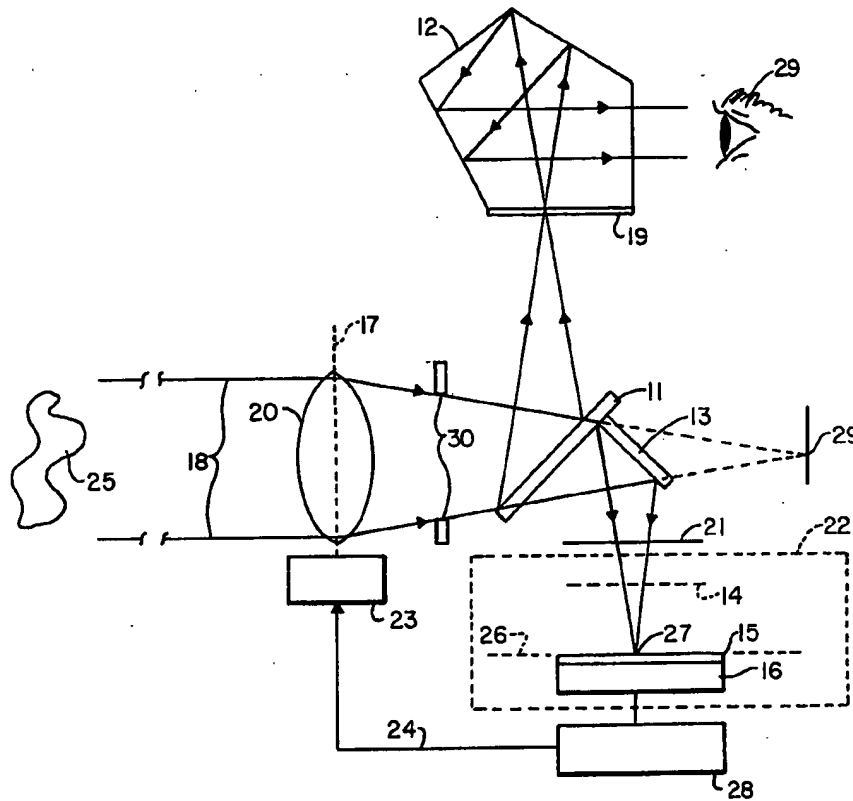


FIG. 2